SKINNER AS MISSIONARY AND PROPHET: A REVIEW OF BURRHUS F. SKINNER: SHAPER OF BEHAVIOUR

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Do we need another book about B. F. Skinner? According to Frederick Toates, the answer is ''yes'' because ''there is still much to be said'' (p. vii) about Skinner. In his recent biography, *Burrhus F. Skinner: Shaper of Behaviour* (2009), Toates attempts to integrate Skinner into the mainstream of psychology by showing areas of commonality between Skinner's radical behaviorism and subdisciplines within psychology such as cognitive, social, and biological psychology. Admirably, although in some instances understandably naively, Toates attempts to demonstrate the power of positive reinforcement to explain myriad complex behaviors, including a fairly lengthy interpretation of religious behavior. In addition, Toates credits Skinner for being ahead of his time on both social and environmental issues. Toates falters, however, in his insistence that behavior analysis still needs and can benefit from cognitive concepts. He nevertheless provides an otherwise objective and sympathetic view of Skinner the person and the behavioral science he helped to create in a book that should be informative for both behavior analysts and those outside the field.

Key words: B. F. Skinner, behaviorism

Perhaps no other figure in the history of psychology has contributed so much to the science and at the same time generated so much controversy as B. F. Skinner did. His experimental research with a few rats in the early 1930s, resulting in the publication of his first book, *The Behavior of Organisms* (1938), laid the groundwork for a new experimental discipline within psychology, which grew into a unified natural science—behavior analysis—that consists of an experimental branch called the experimental analysis of behavior, an applied branch called applied behavior analysis (aka behavior modification), and a theoretical branch called radical behaviorism (aka behaviorism). But his attempt to extrapolate principles from the animal laboratory to the understanding of human language (e.g., Skinner, 1957), as well as his writings on the implications of a natural science of behavior for freedom and dignity (e.g., Skinner, 1971), attracted vitriolic and often ad hominem attacks from academicians, politicians, and others.

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That being said, no other psychologist has been so influential, an accomplishment recognized by the American Psychological Association (APA) when it conferred on Skinner its very first Citation for Outstanding Lifetime Contribution to Psychology in August, 1990, which read, in part, ''Few individuals have had such a dynamic and far-reaching impact on the discipline'' (1990, p. 1205). This acknowledgment was not the first one by the APA. In 1958, Skinner received the Distinguished Scientific Contribution award, and in 1971, he received the APA's Gold Medal Award given ''to a senior American psychologist in recognition of a distinguished and long-continued record of scientific and scholarly accomplishment'' (1972, p. 71). Although other eminent psychologists have received the award, perhaps no other citation began as Skinner's did: ''When historians decide, 100 years from now, which psychologists of our day are most deserving of remembrance, it may well be that Burrhus Frederic Skinner's name will lead the list'' (1972, p. 71). In fact, a study by Haggbloom (2002) shows just that: As measured by scores on three qualitative and three quantitative variables, Skinner ranked as the most eminent

psychologist of the 20th century. In addition to awards from the APA, Skinner was awarded the National Medal of Science in 1968 and Humanist of the Year Award in 1972 from the American Humanist Association.

It should not be surprising that several biographies of Skinner as well as books attempting to explicate his work have appeared over the years (e.g., Bjork, 2002; Carpenter, 1974; Evans, 1968; Nye, 1979, 1992; O'Donohue & Ferguson, 2001; Richelle, 1993; Sagal, 1981; Weiner, 1996). The most recent entry (also the latest book in the Mind Shapers series published by Palgrave Macmillan) is *Burrhus F. Skinner: Shaper of Behaviour* by Frederick Toates (2009), a professor of biological psychology at the Open University in the U.K. Toates' ''guiding principle'' for his book is that ''there is still much to be said'' (p. vii) about Skinner. Toward that end, the book is an attempt to ''integrate Skinner into the mainstream of psychology by indicating where bridges can be built (e.g., with cognitive, social and biological perspectives)'' (p. vii), a laudable goal.

However, a glance at the table of contents reveals a less than systematic approach toward this goal. For example, after a couple of biographical chapters, there is a curious chapter titled ''Looking at the Evidence,'' which purportedly surveys ''some of the experimental evidence that relates to the perspective of Skinner'' that ''people can act without having conscious insight into the causes of their actions'' (p. 49). I'll return to the specifics of this chapter, but my reason for mentioning it at this point is that it occurs between the two biographical chapters and the only two chapters that, by name at least, are consistent with Toates' goal of integrating Skinner with mainstream psychology. To wit, Chapter 4 is titled ''Linking Skinner to Other Perspectives in Behaviour,'' and Chapter 5 is titled ''The Relationship with Biology.'' To be fair, Toates does describe mainstream psychological research in other chapters in an attempt to reconcile it with Skinnerian psychology.

The remaining chapters deal with philosophical and social implications of Skinner's work, such as ''Determinism, Freedom, and Autonomy'' (Chapter 6), ''Skinnerian Advice for Living Life'' (Chapter 7), ''Social Policy'' (Chapter 8), ''Development and Education'' (Chapter 9), ''Helping to Ease Human Suffering'' (Chapter 10), ''Ethics, Religion and the Skinnerian Good Life'' (Chapter 11), and ''The Environment and a Sustainable Future'' (Chapter 12). In each of these chapters, Toates offers up a smorgasbord of philosophical and practical problems for which he suggests Skinnerian solutions based largely on positive reinforcement. Although Toates' applications are sometimes naive, they nevertheless attempt to reveal the power and range of solutions based on operant learning.

Throughout the book, Toates simultaneously suggests where the principles of operant learning may be fruitfully extended to the understanding of complex human behavior and where they are insufficient for the job and therefore require supplementation from other perspectives, in particular, from cognitive psychology. Toates clearly believes that Skinner got it right in many respects and attempts to show some of the areas in which he thinks a Skinnerian perspective may prove to be the most useful, in particular, in ethical behavior and in working toward a sustainable environment. Toates also appreciates the utility of the concept of positive reinforcement in both explaining behavior and changing it. In fact, one of the goals of his book is to present ''evidence of the centrality of the principle of reinforcement,'' while at the same time arguing that ''reinforcement is only *one* process amongst others … in determining behavior'' (p. 14).

And, often, Toates gets it right too. For example, he suggests, as some behavior analysts have, that along with Copernicus, Galileo, and Darwin (and perhaps Freud), Skinner's ideas led to the dethroning of some long-held beliefs about humanity, and points out that the consequences for doing so were nothing less than heresy. Elsewhere, Toates notes that in

extrapolating from nonhuman to human behavior, Skinner was not asserting that rat and human behavior are identical but only that "there are some important principles in common" (p. 7). Toates also gets radical behaviorism right, noting that it did not rule out mental terms from the discussion although such terms were "not permitted to be part of the *explanation* of behavior" (p. 7). However, more than once, Toates uses locutions like "we are not permitted to say …," implying that Skinner or behavior analysts formally prohibit talking in certain ways, when, in reality, the reason behavior analysts avoid locutions such as "The rat pressed the lever because it was hungry" is that these explanations are circular (Skinner referred to them as explanatory fictions) and they often function only to "allay curiosity and to bring inquiry to an end" (Skinner, 1957, p. 6). In other words, explanations that appeal to hypothetical entities and processes do not point to the objective, potentially manipulable independent variables that science deals with.

Toates understands that contingencies of reinforcement are naturally occurring and those that arise from others (e.g., parents) are mostly unintentional, often resulting in the conditioning of undesirable behavior. Toates also gets right the notion that an individual's history of reinforcement may be viewed as an ultimate cause of that person's behavior (see also Alessi, 1992; Schlinger & Poling, 1998, pp. 40–41).

Toates lauds Skinner's scientific discoveries and applications to areas outside the animal laboratory, but at the same time states that Skinner was "profoundly radical to the point of being outrageous" (p. 19). Toates then offers three possible responses to the dilemma that Skinner is hard to ignore because he was the most famous scientist in America. The first is to read and try to understand what Skinner was saying and then reject it out of hand. The second response "is to accept the message whole-heartedly and become a fundamentalist Skinnerian" (p. 19). The third reaction is the one that Toates develops in his book, namely, a compromise position in which the "fundamental and often grossly underestimated and misunderstood determinants of behavior" described by Skinner "need to be integrated with a range of other processes that together make up a human," all the while acknowledging that the processes described by Skinner "have a prior claim to special importance since we can, relatively painlessly, do something about them" (p. 19). My read on this compromise position is that we can include other approaches in the discussion about mechanisms or processes responsible for behavior, but if we want to do something about behavior, such as change it, then behavior analysis is the only game in town.

But Toates' compromise position is an odd one. For example, he gets hung up on whether we can prove the assumption of determinism, namely, that behavior is lawful and orderly. The implication is that Skinner had some investment in whether that assumption was generally accepted. But, of course, although Skinner operated under the assumption of determinism as a basic researcher and as a philosopher, he never got bogged down in attempts to prove it. From a scientific perspective, every time a functional relation is demonstrated between behavior and some independent variable, whether it is environmental, genetic, or physiological, any assumption of free will is weakened just a little bit. Toates suggests that there might be a "pragmatic middle-line, where some kind of autonomy is thought to exist side-by-side with a belief in the efficacy of operant conditioning" (p. 20). But then Toates himself comes down squarely on the side of determinism, with the caveat that not all of the determining "factors are of the kind emphasized by Skinner" (p. 20). Toates then notes quite rightly that we can embrace the methods of operant learning "without thereby accepting the full Skinnerian package with its total rejection of autonomy," but goes further by saying that "cognitive processes can play a role in the explanation of behavior" (p. 20).

Thus, a recurring theme in the book is that although reinforcement is a universal principle and necessary to both understand and change behavior, it must be supplemented by cognitive variables. The problem is that these cognitive factors are not clearly spelled out. Let us return to Chapter 3, ''Looking at the Evidence,'' in which Toates discusses research demonstrating that ''people can act without having conscious insight into the causes of their actions'' (p. 49). First, in a section titled ''The Role of Consciousness,'' Toates cites evidence showing that a person's report of his or her behavior is often at odds with the actual behavior, meaning, of course, that the contingencies responsible for one set of behaviors (e.g., a verbal report) may be different than those responsible for another set (e.g., some verbal or nonverbal behavior). In addition, he describes evidence of priming, namely that presenting certain words can alter our behavior in the absence of awareness. Although he doesn't suggest how this may come about, he fails to note that behavior analysts have offered parsimonious interpretations of such priming effects (D. C. Palmer, 2009; D. C. Palmer & Katz, 2005).

Toates moves closer toward acceptance of the role of cognitive processes in conditioning in the next section, titled ''Conditioning and Conscious Insight,'' in which he concludes that automatic and unconscious operant conditioning occurs in nonhumans and young children, but that conscious insight alters operant conditioning in verbal adults. He does not seem to appreciate, however, that the most parsimonious approach would be to explain such phenomena with the same principles and without moving to a different, cognitive level of analysis, and that this is exactly the approach behavior analysts have taken.

Toates then cites Carpenter (1974) in claiming that operant conditioning cannot account for some types of learning, including incidental learning that ''occurs on a single response, such as the learning of isolated facts or what someone said on a particular occasion,'' claiming that it is ''highly speculative or tautological that reinforcement could be powerfully and selectively operating in all such instances'' (p. 60). But, again, behavior analysts have addressed similar examples parsimoniously without the need to appeal to events taking place at another level of analysis (e.g., D. C. Palmer, 2009; Schlinger, 2008a, 2008b). Notwithstanding these examples, Toates concludes Chapter 3 by stating that ''in light of the recent evidence, much of the Skinnerian argument fares rather well'' (p. 61).

The examples described above suggest that however much Toates acknowledges the ''centrality of the principle of reinforcement,'' in some instances he appears not to appreciate the full range of its explanatory power. But this is understandable: Toates was not trained as a behavior analyst and is not familiar with the breadth of existing behavior-analytic research and theory. As such, Toates does not seem to fully understand the value of behavioral versus cognitive descriptions of events. For example, in describing the story of a British Secret Service agent who was captured during the Second World War and placed in solitary confinement and who occupied himself by reviewing in his mind the lessons he had learned in school and later at college, Toates writes that a behaviorist might describe what the man was doing as engaging in subvocal speech and seeing in the absence of visual stimulation, but then suggests that the value of such a description over a cognitive one is not obvious. I would assert, however, that the value of such a description is obvious, namely that it parsimoniously suggests a continuity of behavior from observable to unobservable without the need to invent hypothetical constructs and, for those, like Toates, who are interested, actually may hint at which regions of the brain are involved.

Elsewhere, Toates suggests that cognitive language can be more useful than behavioral language for understanding brain processes.

Again, I submit that the language of behavior is useful because it implies, in part, that the same neurological structures that mediate overt behavior also mediate covert behavior. For example, when someone thinks (talks) or imagines (sees) to him- or herself, the same areas of the brain are active when they engage in such behaviors at the observable level (Schlinger, 2009). This is more parsimonious and ultimately more practical than a language of inferred hypothetical constructs.

Toates discusses a range of issues related to Skinner or a behavior-analytic interpretation of complex human behavior. But, in many cases, his presentation lacks the depth of understanding necessary to do it justice. For example, in only three pages Toates describes Skinner's approach to language and Chomsky's critique, managing to present only a very rough sketch of each one. Moreover, he doesn't cite numerous references by behavior analysts who have rebutted Chomsky's review or his position on linguistic development (e.g., MacCorquodale, 1970; D. C. Palmer, 1986/2000, 2000). Toates concludes rather simplistically that, ''Some compromise between Chomsky and Skinner might be possible along the following lines. Humans might well have a predisposition ('bias') to learn language and, if so, genetics doubtless plays a role in this. However, the linguistic environment surely plays a crucial role in shaping connections within the brain that underlie language processing'' (p. 73).

Although behavior analysts may appreciate Toates' attempts at behavioral interpretations or suggestions for how behavioral principles may be applied to solving real-world problems, at the same time some of his interpretations or suggestions are naive. For example, citing another non-behavior analyst (Nye, 1979), Toates writes, ''In a Skinnerian analysis, maladaptive behavior would need to be extinguished, while being replaced by desirable ('adaptive') behavior'' (p. 139). Although this may be true in some instances, such a statement suggests a rather simplistic solution to all maladaptive behavior when, in reality, behavior analysts have developed numerous complex treatments for maladaptive behavior based on basic behavioral principles. Nonetheless, Toates does describe some areas within applied behavior analysis, such as the treatment of chronic pain pioneered by Fordyce (1976), that do not, I think, get the broad attention they deserve and, for some reason, have been largely forgotten even by behavior analysts.

With very few exceptions, Toates rarely mentions behavior-analytic research or applications separate from Skinner, and he consistently cites only a handful of other behavior-analytic references throughout the book, mostly Flora (2004), Baum (1994) (although it is curious that Toates did not reference the most recent edition of Baum's book), and Rachlin (1980, but interestingly not Rachlin, 1991). In fact, all too often, Toates relies on secondary sources about Skinner and behaviorism, such as Richelle (1993), Nye (1979, 1992), Carpenter (1974), and Bjork (2002). For example, he quotes Bjork in stating that ''Colleagues described Skinner as 'brilliant' but also 'argumentative, fanatical, and intolerant of other approaches'" (p. 31), a reference to a letter to Skinner by E. G. Boring. But, this gives the impression that it was many colleagues, when, at least based on the reference, technically it should be ''a colleague described Skinner ….''

Although Toates cites Skinner liberally, he omits the extensive research and writings by other behavior analysts who have greatly expanded on Skinner's contributions. Consider just two examples. Toates states that creativity ''poses a problem for an absolute determinist position'' (p. 100) and leaves it at that. But he neglects to cite the work by behavior analysts showing that creative behaviors can be taught (e.g., Chambers, Goldman, & Kovesdy, 1977; Goetz, 1982; Goetz & Baer, 1973; Pryor, Haag, & O'Reilly, 1969) and work on operant variability that demonstrates that much of what

we call creative behavior can be accounted for elegantly within a behavioral framework (Neuringer, 2003, 2004). In another brief section, Toates describes how Skinner's ideas might be relevant to issues of child development but doesn't mention a fairly sizable behavior-analytic contribution to this area (e.g., Bijou, 1976; Bijou & Baer, 1978; Gewirtz & Pelaez-Nogueras, 1992a, 1992b; Novak & Pelaez, 2004; Schlinger, 1992, 1995) or acknowledge that behavioral language about development may be more useful than cognitive language (e.g., Schlinger, 1993). These omissions might be excused because the book is nominally about Skinner; however, because much of the book deals with broader issues of the application of operant learning and its philosophical implications, it would have been nice to see a more thorough treatment. Another omission is the fairly extensive behavior-analytic literature countering criticisms or misrepresentations of Skinner or behavior analysis (e.g., DeBell & Harless, 1992; Dinsmoor, 1992: Gaynor, 2004; Todd & Morris, 1992).

Toates saves his best for last in what are perhaps the two most interesting and compelling chapters, those on ethics and religion and on the environment and a sustainable future. At the beginning of the chapter on ethics and religion, Toates states that Skinner "earned fame as a prophet of how we should reform society" (p. 143). Elsewhere, Toates uses similar religiously imbued language to describe Skinner. For example, earlier in the book, Toates writes that, "Skinner viewed himself not just as a scientist discovering laws governing behavior but also as a missionary and ambassador, whose role it was to convert the world to the cause of studying behavior as a science and implementing its results" (p. 16). It is not clear whether Skinner really viewed himself in such terms (I doubt it) or whether Toates is simply being very liberal in his interpretation. Toates also offers the provocative suggestion that if Skinner had been employed as a consultant for the writing of the Ten Commandments, they might have stressed the reinforcement for moral, ethical behavior rather than punishment of immoral behavior.

These religious references aside, the chapter on ethics and religion contains some interesting speculations. For example, Toates discusses Skinner's frequent references to the survival of the culture as a reason that we should act more cooperatively, but then questions whether the very nature of evolution, not to mention operant conditioning, works against altruistic behavior and in favor of the selfish behavior that has led to many of the world's current problems. Like Skinner, Toates concludes optimistically that perhaps both evolution and operant conditioning can contribute to altruism and cooperation:

> In summary, a consideration of evolution and genes suggests the possibility of a genetic contribution to the potential for altruism and cooperation, as well as to selfishness. If this is indeed so, these possibilities must be manifest in terms of processes of brain and behavior, possibly expressed in Skinnerian terms as "reinforcement processes." Which of the two tendencies dominates would be expected to depend on immediate circumstances and might well reflect in part a lifetime history of social reinforcement. (p. 145)

With respect to altruism, Toates offers the interesting observation that perhaps human beings can feel some distress by observing others' suffering and that, at times, this vicarious suffering might function as a motivating operation. Any altruistic behavior that reduces it would be negatively reinforced.

One of the truly unique contributions of the book is Toates' discussion of how Skinnerian practices are consonant with a number of features of religious behavior, even though for some religious behaviors, such as martyrdom, Toates still reserves a role for cognitive processes. These exceptions aside, Toates applies a general behavioral approach to religion as, for example, when he writes that "Much religious practice might be understood in terms of forgoing immediate reinforcement in the

interests of long-term reward, as mediated by a rule-governing process'' (p. 150), even though he doesn't specify what that process is or how it might work. In the same chapter, Toates discusses Skinner's religious upbringing and how that might have influenced his religious beliefs and behaviors. He also juxtaposes Skinnerian psychology with ''religious metaphysics,'' showing where they ''clash,'' in particular, on the issue of whether humans are free to make choices as a ''God-given attribute,'' or whether, as Skinner suggested, ''we are the result of an accidental sequence of evolutionary steps accompanied by the vagaries of equally unplanned schedules of reinforcement'' (p. 154). Toates concludes the chapter by showing that some, but by no means all, theologians actually embraced certain aspects of Skinner's philosophy, not necessarily derived from his science of behavior (e.g., that we should behave for the good of each other and of the planet and that we should emphasize the use of positive reinforcement rather than aversive control), even though Skinner's position on this latter point was not based on a solid experimental foundation. Having said that, it is curious that Toates would write, ''It is a little ironic that Skinner wished to abandon praise as a feature of our culture since it can be a particularly good (positive) social reinforcer'' (p. 53), a statement without any clear reference.

The final chapter is a timely one on ''The Environment and a Sustainable Future.'' Throughout the book Toates touts Skinner as being ahead of his time on both social and environmental issues, again, not necessarily issues that are directly related to a natural science of behavior, but certainly ones that could be addressed with such a science. For example, Toates quotes one writer as referring to Skinner as the first feminist psychologist. Elsewhere, Toates states that in *Walden Two* (1948), Skinner ''made a green proclamation'' ''years before the terms 'sustainability,' 'climate change,' and 'global warming' came into the headlines'' (p. 16).

Toates points out that we are victims of individual and social traps in which the short-term benefits of behavior occur at the expense of longer term disadvantages and notes, correctly, that ''it is more useful to explain such phenomena in terms of maladaptive reinforcement that emerges in groups rather than as 'collective responsibility or 'social evil''' because the ''former can be tried'' (p. 162). Toates assumes a Skinnerian perspective in solving these problems by stating that ''Research efforts need to focus on how to get a reversal of reinforcers, so that ecologically desirable actions are immediately reinforced at an individual level'' (p. 163). Behavior analysts have a fairly long tradition of research designed to reinforce such behaviors or punish ecologically unsound behaviors (e.g., M. H. Palmer, Lloyd, & Lloyd, 1977; Slavin, Wodarski, & Blackburn, 1981; Van Houten, Nau, & Merrigan, 1981). Toates hits the nail on the head, though, when he writes that the challenge to ''act now for a future of *sustainability* … is in part a technological one but, perhaps even more fundamentally, it is a *behavioral* one'' (p. 166).

Toates concludes the book with a message to behavior analysts or ''admirers of Skinner'' ''to bring the techniques of behaviourism into much greater public awareness and acceptance'' (p. 176). This is a message we behavior analysts need to heed well and soon.

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